

Notes on Acari, with Descriptions of New Species. By J. N. HALBERT.
M.R.I.A. (Communicated by Dr. W. T. CALMAN, F.R.S., Sec.L.S.)

(PLATES 20-22.)

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WITH a few exceptions the Acari recorded in the following paper were collected in Ireland since the publication of the Clare Island Survey reports seven years ago. The list of Acari there recorded (23) was practically a complete one in so far as the Irish terrestrial forms were then known. A few years later an account was given of the species found living in the zones of the sea-shore affected by the tides (24). At the present time, collections are being made with the intention of preparing a more complete list of our Acarid fauna, but much remains to be done in this respect. Meanwhile it is desirable to record a certain number of new and interesting forms as a contribution to our knowledge of the Acari in these islands.

The literature dealing with the Acari is very considerable; large numbers of species have been described by European workers in recent years, and, as very many of these species are unfigured, the difficulties of identification are greatly increased. In the present paper short descriptions only are given, and such figures as seem necessary in a group where the details of structure are so varied and often of so comparative a character. In all, some sixty-eight species are recorded; sixteen of these, and also a few varieties, belonging to the families Gamasidæ, Oribatidæ and Trombididæ, are apparently undescribed. Including these new forms, about forty species are now recorded for the first time from the Britannic area. The types of two of the new species, in *Lasioseius*, were collected by Mr. A. D. Michael on the coast of Cornwall some years ago.

I am indebted to a few friends for assistance in the collecting of specimens, more particularly to my colleague, Mr. A. W. Stelfox; the discovery of some of the more interesting forms is due to him. I have also to thank Dr. A. Berlese for kind help in the identification of some of the species: others are recorded on my own responsibility. The type-specimens of all the new species are in the collection of the Irish National Museum.

GAMASUS (EUGAMASUS) CRASSITARSIS, sp. nov. (Pl. 20. figs. 1a-c.)

Male. A large robust species measuring 1600μ in length; general characters as in the subgenus *Eugamasus*, to which the species belongs. Shoulders well marked; hairs long, those on the second dorsal shield numerous and somewhat adpressed. Sternal region of ventral plate with faint scale-like markings on its anterior half, concave at the centre of the

front margin. Genital aperture strongly chitinized, posterior extremities pointed, reaching to middle of second coxæ. Epistome with a long central spine, and the ends of the lateral spines slope slightly inwards. Maxillary plate transverse, with four long hairs. Chelicerae (fig. 1*a*) somewhat like those of *G. oudemansi*, Berl.; fixed chela armed with two stout teeth, the extremities of which are truncated and minutely dentate, apex of segment bilobed; free chela with one strong tooth slightly recurved.

First, third, and fourth legs long and slender; third segment of last pair with a sharply-pointed ventral spine. Second legs (fig. 1*b*) very stout; femoral calcar of moderate size, curved posteriorly, bluntly pointed; cap of axillary process flattened and produced towards apex of calcar as in *G. oudemansi*, Berl.; on the outer side of the femur there is a marked chitinous prominence (fig. 1*c*) with a terminal hair; genual process well developed, cap concave; process of fifth segment not prominent, its extremity does not project beyond the ventral outline of the segment. Tarsi strongly swollen at the base and again at the apex; a stout conical tooth stands near the middle of the inner surface.

This fine species is evidently allied to *Gamasus magnus*, Kramer, and to *G. oudemansi*, Berl. It is however larger, and differs from both in the presence of a chitinous projection on the outer side of the second femora; the tarsi and chelicerae are also different. It also resembles the species redescribed as "*Eugamasus loricatus*, Wankel" by Oudemans (38, p. 114), especially in the form of the tarsi, but differs from this species in the armature of the second legs and in other particulars.

Locality. Two males found under a sunken stone at high-tide mark in company with the local *Chelifer dubius* (Camb.) at Mount Garrett Wood, near New Ross, Co. Wexford, by Mr. R. J. Phillips, 12th March, 1922.

GAMASELLUS (PROTOLÆLAPS) GRANULATUS, sp. nov. (Pl. 20. figs. 2*a, b*.)

A very distinct species belonging to the subgenus *Protolaelaps*, Berlese (13, p. 137). It is remarkable for the comparatively large size of the ventral plates, more especially of those enclosing the peritreme. Verified by Dr. Berlese.

Female. Colour yellowish brown, shape pyriform. Cuticle very distinctly punctate-striate. The two dorsal plates are of equal breadth, leaving a rather wide uncovered lateral margin; the second plate is undulate in front and almost reaches end margin of body. These plates are minutely punctured, and there are faint traces of reticulate markings. Hair armature short and stout. Jugular plates absent. Sternum with a bow-shaped front margin, rather long, reaching middle of third coxæ; end margin truncate. Metasternal plates with a stout hair on outer margins. Genital plate sub-quadrangle (length 75 μ), anterior half lying between last pair of coxæ. Ventro-anal plate large, twice as broad as long (length 100 μ , breadth 200 μ);

front margin flattened, end bluntly pointed and reaching margin of body. All of these ventral plates are minutely punctured. Peritreme strongly sinuate, lying close to the legs on the inner margin of a large plate which projects in a broad tongue-shaped process beyond, but does not enclose, the last pair of legs. Rod-like endopodial plates lie between the third and fourth coxæ.

Epistome with a long central spine fringed with minute hairs. Maxillary plate quadrate; the small curved lobes are placed on a raised central part which projects beyond the front margin of the plate. Chelicerae very minute. Palps normal. Legs robust, of moderate length, clothed with short hairs; ambulacra on all pairs. Length 363 μ , breadth 275 μ .

Locality. Apparently a rare species; found on two occasions, in January and November, under stones in the Tolka Valley, near Dublin.

GAMASELLUS (PROTOLÆLAPS) MUCRONATUS (*G. et R. Can.*).

1881. *Gamasus mucronatus*, G. et R. Canestrini, **19**, p. 1081.—1882. G. et R. Can., **20**, p. 52.—1885. G. Can., **18**, p. 78.—1887. *Cyrtolaelaps mucronatus*, Berlese, **1**, Fasc. xlv. n. 5.—1921. Berlese, **15**, p. 81.

This species may be recognized by its large size, measuring 1200 μ in length, and the large strongly-chitinized dorsal plates. In addition to a number of minute hairs, both plates carry two pairs of strong spines feathered at their extremities; one pair at the end of the second plate project well beyond the posterior margin of the body. The peritreme lies close to the coxæ on the inner margin of a large peritrematic plate. The ventro-anal plate is large, V-shaped, emarginate in front, its extremities lying close to the genital plate and the posterior margin of the body.

Locality. Females found in rotting potatoes at Drumcondra, near Dublin, in April. The identification has been verified by Dr. Berlese, who refers (*in lit.*) the species to his subgenus *Protolaelaps*. The male has not been described.

GAMASELLUS (PROTOLÆLAPS) SUBNUDUS?, *Berl.* (Pl. **20**. fig. 3.)

1918. Berlese, **13**, p. 138.

The following is a brief description of a *Gamasellus*, as well as of its larva and nymph, which probably belongs to the present species, although the identification is given with some reserve.

Adult female pear-shaped. Epistome with a long sinuate spine, minutely spiculate at the base. Dorsal shields of moderate size and uniform breadth, distinctly punctate, the punctures lying in transverse rows; margin of second shield broken up into small folds, and there is a wedge-shaped fissure in the middle of the front margin; hairs sparse and weak. Epidermis strongly granulate. Sternum of moderate size (length 132 μ), hinder corners slightly rounded. Endopodial plates very strongly developed and

produced in sharply-pointed processes between the coxæ. Peritreme undulate, and protected by a narrow plate which reaches to the end of the fourth coxæ. Ventro-anal shield very small, rotund, broader than long (breadth $165\ \mu$), placed on the posterior margin of the body. Legs of moderate length, second pair slightly more robust than the two hinder pairs. Length $742\ \mu$, breadth at shoulders $430\ \mu$, and in posterior third of body $512\ \mu$.

Larva. Shape much as in adult; close to the end it slopes rapidly to a truncated central part of the posterior margin, at each corner of which is a curved hair; immediately behind these on each side are stouter hairs with slightly clubbed and spiculate extremities; the dorsal hairs are weak. Dorsal shields undeveloped, and the epidermis at end of body is distinctly areolated. Legs and palps very stout, carrying numerous short hairs; ambulae consisting of a single pair of rather narrow leaf-like upper lobes, and two long, lanceolate, lower processes. Length $340\ \mu$, breadth $198\ \mu$. (Pl. 20. fig. 3.)

Nymph. Side margins more parallel than in the adult; end margin truncated, with a small central part projecting below. Dorsal plates large, granular. Side margins of body with short hairs. Epistome, palps, and legs much as in the adult. Length $570\ \mu$, breadth $320\ \mu$.

Locality. Adult female, larva, and nymph found in decaying turnips, North Dublin, in April 1921.

MACROCHELES VAGABUNDUS (*Berl.*).

1889. *Holostaspis vagabundus*, Berlese, 1, Fasc. lii. n. 8.—1902. Oudemans, 37, pp. 11, 43.—1918. Berlese, 13, p. 172.

Berlese places this species in the subgenus *Macrocheles* (*sensu stricto*, 13) of which the type is *Acarus marginatus*, Hermann. In the same paper he records varieties of *M. vagabundus* from South America, South Africa, and Australia, so that the species is of unusually wide range. It may be known by the beautiful sculpturing of the dorsum, which, as well as being distinctly punctured, is ornamented with reticulations and branched chitinous markings on the epidermis. The strong, curved hairs on the margin of the dorsal plate bear numerous very short secondary hairs.

Locality. The only specimens ($\text{♀}\ \text{♀}$, length $930\ \mu$) found in Ireland were under moist pieces of wood lying on the sea-bank at Malahide, Co. Dublin, in September.

DENDROLÆLAPS CORNUTUS (*Kramer*).

1886. *Seius cornutus*, Kramer, 31, p. 257.—*Dendrolaelaps bicornis*, Hull, 25, p. 57.

This species is well described and figured by Kramer (31), and is easily recognized by the presence of two long chitinous horns near the end of the dorsum in the male. In the female (length about $495\ \mu$) the body is rather long and narrow. The sternum fills the entire space between the very large second coxæ, and is gradually widened to its hinder corners. The genital

and ventro-anal shields are remarkably long and narrow, of almost equal breadth, and the latter reaches to within a short distance of the end margin of the body.

Locality. Both sexes occurred under the moist bark of cut pine-logs lying on the Royal Canal bank, close to Dublin, in October 1918. The logs had been brought from an inland locality.

MYONYSSUS DECUMANUS, *Tirabosche*.

A few adult females were found on a Field Mouse (*Mus sylvestris*) caught in the Rocky Valley, Co. Wicklow, by Dr. R. F. Scharff. On the same host were adults of *Laelaps stabulasis*, C. L. Koch, and *L. agilis*, C. L. Koch. It has been found on the common Brown Rat in England (Hull, 25), and Waterston records its occurrence on the House Mouse in the Shetland Islands.

ANTENNOPHORUS UHLMANNI, *Haller*.

A single specimen was found in a nest of the ant, *Lasius mixtus*, Nyl., near Graiguenamanagh, in Co. Kilkenny, by Mr. A. W. Stelfox. This is the only *Antennophorus* hitherto found in Ireland; all the described species, four in number, have been recorded from England.

LÆLAPS (IPHIS) ACULEIFER, *Can.*

1983. *Laelaps aculeifer*, Canestrini, 17, p. 6.—1885. *Hypoaspis aculeifer*, Canestrini, 18, p. 84.—1892. *Laelaps aculeifer*, Berlese, 1, Fasc. lxxviii. n. 10.

Evidently a fairly common species. I have found the female in numbers under bark of decayed trees at Tallaght in April and Greystones in July, under pieces of damp wood in the Tolka Valley in January, and in decayed potatoes at Drumcondra in April. All these localities are in the vicinity of Dublin.

LÆLAPS LATISTERNUS, sp. nov. (Pl. 20. fig. 4.)

Female. Shape broadly ovate, shoulders not prominent. Dorsal plate very large, surface with scale-like markings; hairs short, becoming longer towards end margin, where there are two comparatively long hairs. Sternum very wide and strongly produced between the coxæ at its anterior and posterior corners, end margins slightly undulate, hairs rather long. The genital plate is also rather large (length about 165 μ), marked with lines as in figure. Peritreme comparatively straight, not fused with the pedal plates; the latter are well developed and enclose the fourth coxæ; small obliquely-placed inguinal plates lie close to them. Ventro-anal plate small (length 220 μ , breadth 176 μ), subovate, flattened at end and reaching margin of body.

Epistome in the form of a long, sword-shaped, central spine and two strong lateral teeth. Maxillary plate rather narrow (77 μ). Palps normal. Legs long and robust, first pair of very uniform thickness (length about 506 μ); the fourth pair (length 550 μ) have slightly curved femora, and the tarsi are elongate; there are traces of a division of the terminal part of the tarsus close

to the middle. Hair armature short, that of first pair stronger than the others. Ambulacra normal. Length 530 μ .

Locality. Found under stones in the Lucan Demesne, Co. Dublin, February.

LÆLAPS SIMPLEX, sp. nov. (Pl. 20. fig. 5.)

Female. Long oval, shoulders not well marked. Dorsal plate straight-sided, reaching end of body, with three double rows of weak hairs, two on the posterior margin much longer. Epidermis distinctly striated. Sternum of rather uniform breadth, reaching to middle of third coxæ; front margin undulate, with slight lateral extensions; posterior corners pointed; end margin with a small notch at the middle; the three pairs of hairs are placed close to the margin of the shield. Genital plate exceptionally long (length 110 μ) and narrow, being more than twice as long as broad, reaching well beyond the last pair of coxæ, only slightly widened at the extremity, which is somewhat rounded. Ventro-anal plate small (length 90 μ , breadth 95 μ), widely removed from genital plate and placed on the end margin of the body, evenly rounded in front and truncated behind. A pair of small inguinal plates lie near the side margins. The inner pedal plates lie between the last pair of coxæ, which are partly enclosed by a chitinous extension of the peritreme. Chelicerae small, though of robust structure. Legs and palps stout and of moderate length; inner side of second palp segment with one, and third segment with two stout spines. Length 450 μ , breadth 260 μ .

Locality. Taken under rotten wood at Glendalough, Co. Wicklow, in September.

LÆLAPS FIMBRIATUS, sp. nov. (Pl. 20. fig. 6.)

Female. Long oval. Dorsal plate rather narrow; hairs long, increasing a little in length at end of plate. Sternum rather short; front margin bow-shaped, extending between the coxæ; sides deeply emarginate. Metasternal hairs present, but the plates are indistinct. Genital plate large (length about 150 μ along middle line), elongate, constricted at the middle; front margin produced and elaborately fimbriate, hind margin straight; anterior part of plate marked with longitudinal lines. Ventro-anal plate large (length 175 μ , breadth 150 μ), hatchet-shaped, the bluntly-pointed end directed towards the posterior margin of body; surface with transverse lines; front margin much wider than genital plate. The outline of the plate of an earlier nymphal form is indicated in the drawing. Peritreme with a slight regular curve; there is no protecting plate, and a weakly-chitinized post-stigmatic process encloses the last pair of coxæ. Maxillary plate quadrate, corniculi narrow and placed close together. Legs long and slender (length of first pair 450 μ , of fourth pair 550 μ). Ambulacra rather long and narrow, but otherwise of normal structure. Length 528 μ , breadth 320 μ .

Locality. Found on sprouting potatoes at North Dublin in March of the present year.

COPRIPHIS (ALLIPHIS) HALLERI (*G. et R. Can.*).

1881. *Gamasus halleri*, *G. et R. Canestrini*, **19**, p. 1077.—1882. *Laelaps halleri*, *G. Canestrini*, **20**, p. 57.—1885-'99. *Iphis halleri*, *G. Canestrini*, **18**, p. 93.—1892. *Iphis halleri*, Berlese, **1**, Fasc. lxxvii. n. 6.

Localities. Males and females occurred commonly in decayed roots of Henbane at Clontarf, near Dublin, in August 1918, and under bark of cut pine-logs on the Royal Canal bank in October 1918. Canestrini records it as occurring in decayed potatoes and amongst rotting leaves in December.

LASIOSEIUS (LASIOS.) GRACILIS, sp. nov. (Pl. 20. figs. 7 a-c.)

Female. Shape ovate, shoulders not marked. Dorsal plate large, almost completely covering body, surface with polygonal markings. Hairs long, formed of a strong rib and blade, curved and serrulate, those on end margin exceptionally so (length $65\ \mu$). Frontal bristles shorter and strongly pectinate. Sternum of moderate size, corners not produced between the coxæ; hinder margin straight, with rounded corners about on a level with end of second coxæ. Metasterna small. Genital shield broad posteriorly and rather strongly narrowed towards the front; lying behind it are two thin chitinous bars and two pairs of hairs. Ventro-anal plate of medium size, a little broader than long (length $145\ \mu$, breadth $150\ \mu$), flattened in front and regularly rounded behind. Anal aperture placed a little in advance of the centre of the plate. Inguinal plates linear, placed near side margins. Maxillary plate transverse, evenly rounded at base; corniculi with their apices trifid, directed inwards, and there is a strong hair at their bases. Chelicerae small; fixed limb swollen at the base, where there are four sharply-pointed teeth placed close together; free chela with an oblique chitinous blade and traces of two or three teeth just before the apex. Palps normal. Legs of moderate length, rather slender, furnished with short, curved hairs, some of which are minutely spiculate; length of first leg about $352\ \mu$, of fourth leg $363\ \mu$, not including ambulacra. Length $474\ \mu$, breadth $310\ \mu$.

Dr. Oudemans has partially described (**37**, p. 17) the protonymph, deutonymph, and adult of an Acarid which he calls *Seiulus plumosus*, though it seems doubtful if all of the forms are referable to the same species. *L. gracilis* is allied to "*Seiulus plumosus*," but the legs are obviously longer and more slender, and the hairs of the dorsum are much longer and not so strongly blade-shaped as they are in the Dutch species, which was found on a bat (*Vespertilio dasyenne*) and on a Squirrel (*Sciurus vulgaris*).

Locality. Found on sprouting potatoes at the Albert Model Farm, near Dublin, by Mr. J. G. Rhynehart, early in March.

LASIOSEIUS (LASIOS.) OMETES, *Oudem.* (Pl. 20. figs. 8 a-c.)

A *Lasioseius* found under the bark of trees in Ireland seems referable to this species. I have to thank Dr. Oudemans for kindly lending me his type-specimen for comparison.

Form as in *L. muricatus*, C. L. Koch (Berlese, 1, Fasc. xli. n. 6). Sternum with a wide and deep cleft in the posterior margin extending to about the middle of the plate; the sides of the cleft are usually irregular in outline. Metapodial plates vestigial. Genital plate of the usual shape, punctured; end margin rather strongly chitinized; immediately behind it are four small linear plates arranged in a transverse row. Ventro-anal plate very large, with distinct transverse markings; side margins concave towards apex; the end margin is somewhat truncated, and reaches the posterior margin of the body. The peritreme is normal, and its plate is continuous with the inner pedal plate, the extremity of which reaches the third coxæ. Tritosternum with rather short processes; its base lies in the central depression of the bow-shaped jugular bar. Fixed chela with a row of about ten small teeth, and there are three teeth on the free chela (fig. 8 c). Legs, palps, and capitulum much as in *L. muricatus*, C. L. Koch. Length 580 μ ; breadth 319 μ .

Localities. Females found under bark of decayed logs at Tallaght, and in the Carton Demesne, Co. Kildare, in May.—(See note on p. 392.)

LASIOSEIUS (LASIOS.) LÆLAPTOIDES (*Berl.*)

1887. *Epieirus lælaptoides*, Berlese, 1, Fasc. xl. n. 10.—1916. Berlese, 10, p. 33.—1921. Berlese, 15, p. 82.

Locality. Female found under damp wood lying on the ground in the Tolka Valley, near Finglas, Co. Dublin, in May. Not previously recorded from Britain.

LASIOSEIUS (EPISEIUS) GLABER, *Berl.*, var. CURTIPES, nov. (Pl. 20. fig. 9.)

General structure as in the type-form (Berlese, 1, Fasc. xxx. n. 9); differs in the much shorter first pair of legs; in his description of these, Berlese says: "antici exiliores, corpore fere duplo longiores," and his accompanying figure shows the first legs much longer than the body. In the present variety the first legs are only slightly longer than the body, and the remaining pairs are somewhat stouter. The ambulacra are of the modified, bristle-like type. The genital plate is longer and the ventro-anal plate is broader. Trägårdh has described a variety (*minor*, Träg., 46, p. 432) found in the Sarekgebirge; from this the present variety may be known by the more strongly-produced metapodia, and the form of the ventral plates is different.

Female. Dorsum with scale-like markings, which are distinct only towards the margins. Hair armature weak, stronger towards end margin, on which

are a number of very short spines. Sternum rather large (length $187\ \mu$, breadth $165\ \mu$). Jugularia absent. Metasternal plates extremely small. Genital plate longer than broad, with a thick hinder margin. Metapodial plate much produced, and ending in a bluntly-pointed extremity reaching beyond the front margin of the ventro-anal plate. The latter is large and much broader than long (length $120\ \mu$, breadth $154\ \mu$), front margin truncated, posterior margin evenly rounded. Inguinal plates inconspicuous. Length $429\ \mu$, breadth $252\ \mu$.

Locality. Two specimens found amongst wet moss collected on Lambay Island, Co. Dublin, in July.

LASIOSEIUS (EPISEIUS) SPHAGNI, sp. nov. (Pl. 20. fig. 10.)

This species bears a superficial resemblance, especially in the form of the ventral plates, to *L. lelaptoides*, Berl., but, apart from other differences, it may be easily known by the elongate tarsi and modified ambulacra, which are of the *Episeius* type, with long terminal bristles, while in *L. lelaptoides* these parts are of the ordinary *L. muricatus* type.

Female. Colour light brown, shape broadly ovate. Dorsal plate very large, surface not reticulate, but with indistinct areolations on its anterior part. Hair armature weak, a row on side margins stronger, and there are three pairs of deflexed hairs on the end margins. Jugular plates absent. Sternum normal (length $110\ \mu$). Metasternalia distinct. Genital plate broad, front margin indistinctly serrulate; lying behind this plate are four small linear plates. Ventro-anal plate large, broader than long (length about $200\ \mu$, breadth $264\ \mu$), front margin flattened. Sides produced in a rounded prominence in front, emarginate towards apex, which is somewhat truncated and minutely punctured. Canal of peritreme broad, with the usual post-stigmatic continuation, and protected by a narrow outer plate. Metapodia strongly chitinized, ending in bluntly-pointed extremities, much as in *L. italicus*, Berl. Epistome tricuspid. Maxillary plate quadrate; corniculi small and slightly sinuate, and three pairs of long hairs stand near their bases. Palps normal. Legs long and robust; length of first and fourth pairs about equal ($562\ \mu$); ambulacra with three terminal bristles and a pair of small membranous lobes.

Locality. Two specimens found in sphagnum collected in the Black Valley, Howth, Co. Dublin, in October.

LASIOSEIUS (EPISEIUS) ITALICUS, Berl., L. (E.) MICHAELI, sp. nov.,
L. (E.) TENUPIES, Halbt., and L. (E.) MAJOR, sp. nov.

From a study of the species belonging to the "*italicus*" group of the subgenus *Episeius*, Hull, which includes those species of *Lasioseius* in which the tarsi are elongate and the ambulacra armed with bristles instead of the usual

lobes (Hull, 25; Halbert, 23, 24), I believe there are at least four closely-allied species in these countries. The male and female of three of these are now known to me, and although the general structure is much alike, the males possess excellent characters in the form of the mandibular calcar. These three species are *L. (E.) italicus*, Berl., *L. (E.) michaeli*, sp. nov., and *L. (E.) major*, sp. nov. The male of *L. (E.) tenuipes*, Halbt., has not been discovered, and until this is found I must rely on the characters of the single specimen described (23, p. 78). The females in the case of two of the species, i. e. *L. (E.) italicus* and *L. (E.) michaeli*, are difficult to separate; indeed, the one description would suit both species almost equally well. Unfortunately the males, as in many Acarid genera, are decidedly rare; as an instance, I may mention that out of a gathering from one locality of about one hundred examples of "*italicus*" aggregate three males were found, and this only by close searching of moss brought home from a suitable locality. The species frequent wet moss, liverworts, &c., and may be found amongst submerged mosses growing on stones in mountain-streams, in company with mites of the genera *Calonyx*, *Panisus*, and *Aturus*.

The female of *L. (E.) italicus*, Berl., is described in 4, p. 234, and is excellently figured by Dr. Berlese in a later paper ("Redia," vi. pl. 19. fig. 35), while the male is briefly described in 10, p. 34. In view of the great similarity of the females of these species, it will probably be sufficient to give a short description of *L. (E.) italicus*, and then briefly tabulate the chief characters of the four species. Figures of the male mandibular calcars of three species and of the female of *L. (E.) major*, sp. nov., are given in the present paper.

L. (E.) italicus, Berl. *Female*. Shape pyriform. Dorsal shield large, reaching end of body; sides often slightly rounded, surface reticulate. Hair armature weak on centre of dorsum, much stronger and somewhat adpressed at the margins, where they are arranged in a double row. There is a raised tubercle near the posterior margin. Epistome of the tricuspid *Episeius* type. Sternum rather large and wide; both the front and hinder margins are slightly concave, and the latter reaches to middle of the third coxæ. Genital plate hatchet-shaped; hinder margin straight, standing well beyond the fourth coxæ. Vento-anal plate large, much broader than long (length 210 μ , breadth 300 μ), flattened in front; side margins concave near centre, surface with irregular lozenge-shaped markings. Between the last two plates are three pairs of very minute plates arranged in two rows. Peritreme broad and strongly sinuate. The united plates of the peritreme and metapodia extend beyond the last pair of coxæ in an obtusely-pointed triangular form. Legs very long, with attenuated tarsi, and the ambulacra have bristle-like lateral lobes and a lanceolate upper lobe. Length about 640 μ , breadth 420 μ .

I. A raised tubercle present near end of dorsum in both sexes.*

A. The extremities of the metapodial plates slope downwards in an oblique line towards the body margins.

a. Male: Length 495 μ , breadth 330 μ . Calcar of mandible (Pl. 20. fig. 11) long, consisting of a thickened rib and narrow blade, flagelliform, curved strongly downwards under the maxillary plate, extremity sinuate. Female: Length 640 μ , breadth 420 μ ; body usually broader and more rounded than in the following species. Length of first leg 716 μ , of fourth leg 768 μ . (Localities: Streams at Glencullen, Glencree, Kilmashogue, in the Dublin Mountains; Reservoir at Greystones, July. Lambay Island, July, &c.)

Lasioseius (Episeius) italicus, Berl.

b. Male: Length 495 μ , breadth 330 μ . Calcar of mandible (fig. 12) long (length about 210 μ , not including base of mandible), almost straight except at the apex, where it is deflexed. Length of first leg 470 μ , length of fourth leg 614 μ . Female: Length of type 640 μ , breadth 390 μ ; length of first leg 692 μ ; length of fourth leg 768 μ . (Locality: Mill Bay, Land's End, England; taken by Mr. A. D. Michael in November 1892.)

Lasioseius (Episeius) michaeli, sp. nov.

B. Extremities of metapodial plates truncated, lying in a straight line across the venter. Male unknown. Female described in 23, p. 78. Length about 740 μ ; breadth 486 μ . Length of first leg 742 μ , of fourth leg 820 μ , including ambulacra. (Locality: Mountain-stream near Glencree, May.)

Lasioseius (Episeius) tenuipes, Halbt.

II. No tubercle at end of dorsum.

Male: Length 520 μ , breadth 374 μ . Calcar of mandible (fig. 13 b) short (length about 70 μ , not including base of mandible), straight, or slightly curved; apex deflexed. Female (fig. 13 a), length 740 μ , breadth 486 μ . Body broadly pyriform, posterior margin somewhat flattened. Ventro-anal plate large (length 220 μ , breadth 396 μ), distinctly reticulate. Length of first leg 820 μ , of fourth leg 890 μ . (Localities: Streams at Kilmashogue (σ & ρ , December) and Glencullen (ρ ρ , October), Mill Bay, Land's End, England (σ & ρ , November, coll. A. D. Michael).)

Lasioseius (Episeius) major, sp. nov.

LASIOSEIUS (PLATYSEIUS) SUBGLABER (*Oudem.*). (Pl. 20. fig. 14.)

1906. *Hypoaspis subglabra*, Oudemans, 36, p. 88.

A very distinct species, evidently referable to the subgenus *Platyseius*, Berlese (10, p. 42). Characteristic features are the broad pyriform shape and the very long hairs fringing the side margins of the dorsal shield. These hairs are arranged in an irregular double row and are incurved; on the end margin are two shorter, straight hairs. Length 560–600 μ , breadth 430 μ . Length of first leg 666 μ , of fourth leg 717 μ .

* The male of *L. (E.) tenuipes* is unknown. In a recent paper on Swiss Acari, Dr. Schweizer described and figured what he considers is the male of *E. tenuipes*, Halbt. (41, p. 43). I was struck by the similarity of the male calcar there figured with that of *L. (E.) major* now described. Dr. Schweizer very kindly sent me some mounted specimens (ρ ρ) for examination (locality, Quellen am Kellerssee, 4. iv. 1819) and they are undoubtedly referable to this species. The male calcar figured (Pl. 21. fig. 18) agrees well with that of my type of *L. (E.) major*.

The male of this species has not been described. The general structure resembles the males of *Episeius*. Dorsum as in the female. Free chela (fig. 14) armed with a long process resembling that of *L. (E.) italicus*, Berl., but shorter and less curved, each chela with one strong tooth, in front of the tooth on the fixed chela is a row of very small teeth. Length of male 484 μ , breadth 352 μ .

On account of the apparent difference in the length of the dorsal hairs in the Irish specimens when compared with the published figures (36, Taf. 6. fig. 45), I sent drawings to Dr. Oudemans, who informs me that they undoubtedly represent *L. (P.) subglaber*. The dorsum of this species is frequently coated with fragments of débris which are entangled between the long inwardly-curved marginal hairs, reminding one of what occurs in the Oribatid genus *Damæus*.

Localities. In sphagnum pools at Lough Atorick, Co. Clare, June, and also at Lough Dan, August. Both sexes occurred amongst wet moss collected on the bank of a stream at Glencullen in the Dublin Mountains, in October, and at Drogheda in August.

LASIOSEIUS (LEIOSEIUS) MINUTUS (*Halbt.*).

1915. *Seiulus minutus*, Halbert, 23, p. 76.—1918. *Zerconopsis minutus*, Hull, 25, p. 66.

—1920. *Lasioseius minutus*, Berlese, 14, p. 171.

Hull has placed the present species in a new genus *Zerconopsis*, of which the type is Kramer's "*Gamasus remiger*." Berlese, however, had already referred this species to his subgenus *Zercoseius* (10, p. 33) with *S. spathuliger*, Leon., as the type. On re-examining the Irish specimens of *L. minutus*, it seems to me they fall readily into Dr. Berlese's subgenus *Leioseius*, briefly diagnosed by him as follows:—"Ex gen. *Lasioseius*. Pedes breves et robusti. Truncus elongatus, lateralibus subparallelus. Typus *L. L. minusculus*, Berl." An estuarine species (*L. salinus*, Halbt.) of this subgenus occurs on the Dublin coast (24, p. 125).

Localities. Amongst sphagnum collected on Croaghmore Mountain, Clare Island, Co. Mayo, and under rotten wood lying on the ground in the Carton Demesne, Co. Kildare, May. The male is unknown.

SEIUS TOGATUS, *C. L. Koch.*

Until recently (1916) acarologists referred species of very different facies to Koch's genus *Seius*. Many new genera and subgenera have now been established by Dr. Berlese, so that a great advance has been made. As *S. togatus* is the first species of the genus described by Koch it remains as the type. It is also a very isolated form with but few congeners; three have been described from Europe (see Berlese, 11, p. 150).

Locality. A single specimen found by Mr. Norman Stephens under the moist bark of a pine-stump at the entrance to The Devil's Glen, Co. Wicklow,

in May. The species has been recorded from Scandinavia (Trägårdh), Germany (Koch), Switzerland (Schweizer), and the North of England (Hull).

ZERCON TRAGARDHI, sp. nov. (Pl. 21. figs. 15 a, b.)

Female. Colour pale brown. Shape broad ovate. Side margins strongly serrated, and the end margin is crenulate much as in *Z. trigonus*, Berl. First dorsal shield sculptured with scale-like markings, second shield with areolations and four crescentic pore-like markings as in *Z. triangularis*, Koch; both shields have a double row of irregularly-shaped pits. The hair armature is characteristic; on the side margins there are ten pairs, not including the frontal spines, of strongly plumose hairs (fig. 15 b). The dorsal surface also carries a number of spines which are less strongly plumose than those of the margins; short spines spring from the marginal serrations. Sternum and genital plate of normal shape and rather weakly chitinized. Ventro-anal plate large, elliptical, though somewhat flattened on the front margin, with a few plain hairs. Legs robust and armed with plain spines, those on the middle segments of the first pair are somewhat stronger and are carried on distinct tubercles. Length 340 μ , breadth 250 μ .

This species is allied to *Z. ornatus*, Berl. (3); the body is relatively narrower, and the sides less strongly rounded, the margins are more distinctly serrated and carry fewer plumose spines. The last-mentioned character also separates it from *Z. radiatus*, Berl. (7, p. 9), in which the spines are more numerous.

Locality. Female found at roots of decayed Henbane plants in August.

ZERCON PERFORATULUS, Berl.

1904. Berlese, 3, p. 269.—1914. Berlese, 9, p. 136.

Originally described as a variety of *Z. triangularis*, C. L. Koch, and later raised to specific rank. Easily distinguished by the marking of the dorsal shields. In *Z. triangularis* these bear scale-like markings, while in the present species the markings are largely replaced, more especially on the second shield, by distinct punctures, and the hair armature also is weaker.

Localities. Glendalough, Co. Wicklow, found under chips of wood lying on the ground, April; Knappagh Wood, Co. Mayo, in moss, August, in company with *Z. triangularis* in both localities.

CERATOZERCON BICORNIS (*Can. et Fanzago*). (Pl. 21. fig. 16.)

1877. *Seius bicornis*, Canestrini et Fanzago, 21, p. 103.—1881. *Gamasus bicornis*, Kramer, 29, p. 14.—1882. *Laelaps bicornis*, G. et R. Canestrini, 20, p. 78.—1885. *Sejus bicornis*, Canestrini, 18, p. 91.—1887. *Zercon bicornis*, Berlese, 1, Fasc. xli. n. 8.—1910. Berlese, 7, p. 346.

This species has been described and figured as having only one plumose spine on the two chitinous horns of the posterior margin. Instead of this, in

the Irish specimen (length 342 μ , breadth 220 μ), there are two plain spines (fig. 16), the outer one being a little longer than the other. It is possible, however, that the specimen may be immature. Canestrini remarks: "le quali portano all' apice, nelle forme giovani, ciascuna due setole, nelle piu avondate di età ciascuna una setola robusta diretta in dietro e in dentro" (20).

Locality. One female found under a stone on the Malahide sandhills in August.

POLYASPINUS CYLINDRICUS, Berl. (Pl. 21. fig. 17.)

1916. Berlese, **11**, p. 134.—1917. Berlese, **16**, p. 10.

This interesting genus was founded to receive the present species, and belongs to the tribe Polyaspidini of Berlese's recent classification of the family Uropodidæ (16). The species may be recognized by the elongate sub-parallel shape; the central area of the dorsum is protected by a long, narrow shield, smooth at the centre, roughened at the sides; at the end of this are three small shields, of which the middle one is the least, arranged in a transverse row. The marginal shields are represented by a row of small hair-bearing plates, and on the actual body margin are numerous similar plates. The venter is protected by strongly-chitinized and fused plates; their margins are indicated by thickened ridges. Peritreme placed on the side margins of the body. Hairs simple and blade-shaped. Legs robust, claws of the first pair much reduced. Length about 670 μ , breadth 300 μ . The male is unknown. Identification verified by Dr. Berlese.

Locality. Several females found under logs of wood half buried in the mossy banks of the stream between Glendalough and Laragh, in April.

TRACHYTES PYRIFORMIS (Kramer).

1876. *Trachynotus pyriformis*, Kramer, **28**, p. 80.—1877. Canestrini et Fanzago, **21**, p. 68.—1882. Kramer, **30**, p. 420.—1892. *Trachynotus ægrota* var. *pyriformis*, Berlese, **1** (Mesostig. Supp. p. 94).—1894. Michael, **33**, p. 313.—1915. Berlese, **9**, p. 134.

The above are the principal records undoubtedly referring to Kramer's species, which was described in 1876. There has been confusion between this species and the form described as *T. ægrota* by Koch, and if the latter were clearly recognizable it would be the type of the genus *Trachytes*. There is doubt, however, concerning the identity of Koch's *T. ægrota*; a species supposed to be the same was described and figured by Dr. Berlese (**1**, Fasc. xxxviii. n. 10), but he has since suppressed this, stating that it may have been identical with either of his two recently described species, *T. lambda* or *T. tubifer* (**9**, p. 135). It would then follow that *T. pyriformis*, Kramer, is the type of the genus *Trachytes*. Fortunately this species was carefully described and figured by Kramer (**28**). Mr. A. D. Michael has recorded both *T. ægrota*, Koch, and *T. pyriformis*, Kramer, from English localities, but he did not describe the first-mentioned form.

Locality. Several females were found under branches and pieces of wood lying on the river bank at Glendalough in April.

TRACHYTES PI, *Berl.*, var. PAUPERIOR, *Berl.*

1915. *Berlese*, 9, p. 135.

Differs from the typical form (7) in its paler colour, smaller size, and in the form of the epigynum which is more elongate and punctured. The length of the Irish specimen is $484\ \mu$, breadth $286\ \mu$. Evidently closely allied to *T. minima*, Träg. (44, p. 448), but in the present form the anterior part of the body is much more elongate and the shoulders are less marked.

Locality. A single female found under decayed wood at Poulanass, Glendalough, in April.

UROSEIUS ACUMINATUS, *C. L. Koch.*

Locality. A few specimens were found in company with numbers of *Uropoda obscura*, *C. L. Koch.* in decaying potatoes, Rocky Valley, Co. Wicklow, September 1921. The species has been recorded from Italy, Switzerland, Germany, and Great Britain. Hull queries the "*Cilliba vegetans*" of (25) as the present species, but the nymph recorded as such can have no relationship with *Uroseius*. The adult form of the "*Cilliba vegetans*" of authors has not been made known.

DINYCHUS (PRODINYCHUS) CARINATUS, *Berl.*

1903. *Berlese*, 3, p. 247.

This species is briefly described in the above reference, and it is not figured; *Dr. Berlese*, who has kindly verified the identification, refers the species (*in lit.*) to his subgenus *Prodinychus*. The size is rather small for this genus (length of Irish specimens $622\ \mu$, breadth $333\ \mu$); shape of main body a regular oval, anterior part rather acutely pointed. In the middle line of the body there are two carinæ, and between these and the slightly raised lateral margins the dorsum is concave.

Locality. I have found this distinct species in two localities in Co. Dublin, once in decayed bulbs in January, and under bark of old moss-grown tree trunks at Lucan in April.

PHAULOCYLLIBA VIRGATA (*Hull*).

1918. *Cillibano virgata*, *Hull*, 25, p. 44.

The original description is as follows:—"Sub-circular, smooth, claret brown. Dorsal shield divided by a very shallow median furrow forked behind the middle and curved backwards on each side to the margin, leaving a transverse part behind which bears a pair of clavo-pectinate setæ. Two similar setæ stand in a line with these on the lateral margin. Epigyne oval, rounded at both ends, apiculate in front. Ventral shield reticulate."

This species should certainly be referred to the genus *Phaulocylliba*, Berlese. Apart from other differences it may be easily known from *Cylliba* by the absence of the marginal plates, a feature not referred to in the original description. The epigastric region of the venter is rather indistinctly defined and includes the anal foramen, so that the original figure (25, pl. 1, fig. 4) is inaccurate in this respect. The Irish specimens measure $970\ \mu$ in length.

Locality. A few specimens found at roots of decayed Henbane plants at Clontarf, Co. Dublin, in August.

TRACHYUROPODA (DINYCURA) CORDIERI, *Berl.*

1916. Berlese, **11**, p. 145.

A species referred by Dr. Berlese to the subgenus *Dinycura*, of which it is apparently the type. A characteristic feature is the double row of small piligerous plates lying between the extremities of the marginal shields at the end of the body, much as in the genus *Discopoma* except that there is but one row in this genus. These small plates vary greatly in number (16 to 22) in *T. cordieri* due to a few of them fusing with one another, or with the extremity of the marginal shields. The ventral line is thickly chitinized and divides the epigastric region into two parts, which lie at different planes. The female resembles the male in general structure; the epigyne is large and of the usual arch-like form, its ventral surface is strongly punctured and is produced anteriorly in a long chitinous process which ends in two or three points. Length of female $563\ \mu$, breadth $357\ \mu$. Identification verified by Dr. Berlese.

The *nympha heteromorpha* measures nearly $550\ \mu$ by $385\ \mu$; on the ventral side the area surrounding the acetabula is distinctly reticulate. The ventro-anal plate is of moderate size (length $70\ \mu$, breadth $165\ \mu$); it is supported by a thick transverse bar which also forms the metapodial line.

Locality. The male, female, and nymph were not uncommon under damp wood lying on the Malahide sandhills, Co. Dublin, in September.

TRACHYUROPODA TROGULOIDES, *Can. et Fanzago*, var. *CELTICA*, *Halbt.*
(Pl. 21, fig. 18.)

1907. *Trachyuropoda celtica*, Halbert, **22**, p. 67.

Described as a new species in the above reference, but more accurately placed as a variety of the present species, a decision in which Dr. Berlese agrees (*in lit.*). This variety differs from the typical form as described and figured by Italian acarologists (1, 5, 21) in its smaller size (length of female $820\ \mu$, breadth $486\ \mu$; length of male $742\ \mu$, breadth $436\ \mu$). The form is more parallel-sided, and the raised central part of the dorsum is of more uniform breadth throughout, while in the typical form its terminal part is much wider than the rest. The sculpturing of the ventral surface is also somewhat different (figured in 22).

Localities. Both sexes occurred in nests of the ant *Lasius niger* under stones at Tallaght, Co. Dublin, and it was also found in company with *Lasius flavus* on Lambay Island off the coast of Dublin. Mr. A. D. Michael found it with ants at Land's End, Cornwall (33), and Mr. H. St. J. K. Donisthorpe records it from other English localities associated with *Lasius niger* and *T. cæspitum* (Entomologist's Record, 1909 and 1920).

CILLIBANO DINYCHOIDES, Hull.

1918. Hull, 25, p. 45.

A male *Cillibano* found in company with *Phaulocylliba virgata* (Hull) is probably to be referred to the present species. The Irish specimen agrees with the description except in the measurements (length about 717 μ). The length of the English specimen is given as 655 μ .

The short description is as follows:—"Sub-circular, smooth, shining reddish brown, uniformly convex. Leg grooves exceedingly faint. Male genital aperture between coxæ iv. rather large (width 85 μ). Femur ii. with a stout conical acute spine underneath. A clavate seta on each side of the anus, projecting beyond the posterior margin."

As is usual in this genus the marginal plates are entire, and in the present species they are separated from the dorsal plate by a very thin line running parallel to the margin in the posterior two-thirds of the body. The metapodial line curves inwards from the body margins to a point a little behind the insertions of the last pair of legs, and it is widely interrupted in the middle line of the body. The female is unknown.

Locality. One male found at roots of decayed Henbane at Clontarf, Co. Dublin, August.

LABIDOSTOMMA LUTEUM, Kramer.

The species recorded in the Clare Island Survey Report (23) as *L. cornuta*, Can. et Fanzago, is in reality *L. luteum*, Kramer. The former is a much larger species and differs also in certain details of structure; it has not been found in Ireland.

L. luteum is probably not uncommon in suitable localities in this country; in the Achill and Westport districts of Mayo it occurs under bark and amongst mosses growing on trees. In the Dublin and Wicklow district I have found it in pine woods.

PHYLLOTEGEUS PALMICINCTUM (Michael).

1883. *Leiosoma palmicinctum*, Michael, 32, p. 280.—1898. *Liaccarus palmicinctum*, Michael, 34, p. 42.—1913. Berlese, 8, p. 92.

Locality. Apparently a rare species in Ireland, two specimens were found under stones at Doo Lough, near Muckross, Co. Kerry, in May. It is recorded by Michael as occurring on the lichen *Peltigera* at Land's End, Cornwall; so far as I can ascertain this Acarid has been found only in Britain.

CARABODES AFFINIS, Berl.

1913. Berlese, 8, p. 72.

Closely allied to *C. marginatus*, Michael, but may be known by the clavate abdominal hairs. Dr. Berlese assures me the Irish specimens are referable to this species, which he records as occurring under bark at Florence. The pseudostigmatic organ has a curved upturned stem and a somewhat flattened club. The lamellæ are broad, flat and granulate, and there appears to be a slightly raised ridge in the middle line of the cephalothorax. Interlamellar hairs stout and plumose at their extremities. The hairs of the dorsum as well as the marginal hairs are clavate, and their extremities are distinctly plumose.

Localities. Common amongst moss and lichens on the Portmarnock sandhills, Co. Dublin, in January. The *Carabodes* recorded as *C. marginatus*, Michael in (39) is the present species.

ORIBATULA (HEMILEIUS) PLANTIVAGA, Berl.1892. *Oribatula tibialis*, Berlese, 1, Fasc. lxiv. n. 1.—1895. *Oribatula plantivaga*, Berlese, 1, Fasc. lxxvii. n. 5 (reference in footnote).—1916. Berlese, 12, p. 322 (Redescribed).

Localities. Found near Mulranny, Co. Mayo, in September, and at Lucan near Dublin in company with *O. oblonga* and other species in February. Hull records it as occurring on rock lichens, *Physcia*, on the coast at Whitley Bay.

DAMEOSOMA MACULOSA, Warburton and Pearce. (Pl. 21. fig. 20.)

1905. Warburton and Pearce, 49, p. 567.

A *Dameosoma* found under bark in the Tolka Valley near Dublin (January) is apparently referable to this species. As it seemed not quite typical I sent drawings to Mr. Warburton, who has kindly verified the identification. The species is remarkable for the long, pointed cephalothorax, also the long lamellæ and the spotted dorsum, though, as the describers remark, these spots are in the epiostracum and are very easily rubbed off. This is so in the Irish specimen, in which they remain only near the margins. The pseudostigmatic organs are bent backwards, and carry on the anterior surface at least four distinct branches (Pl. 21. fig. 19 b); anterior margin of abdomen truncated. Length 418 μ .

DAMEOSOMA MINUS, Paoli, var. *LAMELLATA*, nov. (Pl. 21. figs. 19 a, b.)

1908. Paoli, 39, p. 48.

The form briefly described here must, I think, be identified as a variety of the present species. It differs from the type in the larger size and in the presence of well-defined lamellæ on the cephalothorax; in *D. minus* these are rudimentary.

Cephalothorax rather long and with sharply pointed extremity; lamellæ present in the form of two strongly curved ridges reaching from beyond the

middle to the pseudostigmata. The latter are circular and strongly chitinized. Sensory organs with a stout slightly curved stem and a large club-shaped extremity which is minutely spiculate. Abdomen elongate, pointed at both extremities, hairs very weak. Epimera well defined. Legs normal, monodactyle. Length $240\ \mu$, breadth $110\ \mu$.

Locality. Found under dead wood at Poulannass, Glendalough, Co. Wicklow, in March. The typical form is widely distributed, occurring in Italy and near Washington, U.S.A. (40).

CYMBÆREMÆUS MONILIPES (*Michael*).

1888. *Notaspis monilipes*, Michael, 32, p. 381.—1896. Berlese, 1, Cryptostig. ii. p. 37.

Locality. Glendalough, Co. Wicklow, in decayed tree-trunks, March.

HERMANNIELLA GRANULATA (*Nicolet*).

1855. *Hermannia granulata*, Nicolet, 35, p. 469.

In his well-known work on French Oribatids, Nicolet described and figured two species of *Hermannia*, i. e., *H. granulata* and *H. arrecta* (which he believed were distinct), differing from each other in the form of the cephalothorax. As far as I am aware the distinctness or otherwise of these species has not been settled. It seems likely, however, that Nicolet's specimens, which were found in the same localities, represent but a single species, and that the supposed differences in the form of the cephalothorax may be more apparent than real. There is a tendency among acarologists to record *H. granulata* in preference to *H. arrecta*, it is also the first mentioned of the two species in Nicolet's monograph, so I think it is better to refer the Irish specimens here until the question has been decided.

Localities. Adults and nymphs were found in some numbers in a decayed birch log at Glendalough in April, and it has also occurred in moss collected at Howth, Co. Dublin, in June.

TARSONEMUS LATICEPS, sp. nov. (Pl. 21. figs. 21 a-c.)

A species allied to *T. culmicolus*, which is recorded by Reuter (41) as causing injury to meadow grasses in Finland. Differs in the form of the body, the broader capitulum, and in other details.

Female. Form rather short and broad (length $195\ \mu$ – $210\ \mu$, breadth $110\ \mu$); in ovigerous females the body is more elongate, becoming long oval (length $215\ \mu$), the enclosed egg measuring about $115\ \mu$. Side margins sub-parallel, front margin truncated and half covering the head, end margin rounded. Division between the cephalothorax and abdomen and the one at the middle of the latter distinct, but the segments at end of the abdomen are ill-defined. Hair armature very short except for the usual long pair close to the sides of the cephalothorax, and a shorter pair at the angles of the front margin. The sensory organs (Pl. 21. fig. 21 a) arising from small circular stigmata, are large, they may be either globular, or leaf-like with pointed extremities, and both

forms may be present in the same individual. The capitulum is very large and wide in relation to the length (breadth about $40\ \mu$), truncated in front and obtusely round at the end margin. Epimera of the first pair of legs strongly defined. The first two pairs of legs are short and stout; the long terminal hair of the end pair is strongly recurved.

Male (Pl. 21. fig. 21 *b*). Form of the main body much as in female (length $180\ \mu$ – $215\ \mu$, breadth $85\ \mu$ – $100\ \mu$). The capitulum is less transverse (breadth $35\ \mu$), and the hair armature is stronger, there are two pairs of long hairs on the cephalothorax. Legs short and stout; fourth pair (Pl. 21. fig. 21 *c*) shaped much as in *T. floricolus*, being without blades; second segment straight, inner margin slightly sinuate at the extremity; two hairs are present. Third segment armed with a long spine-like hair, and at the base is another shorter hair. As in *T. brevipès* the front margins of the third and fourth epimera are ill-defined.

The male larva is as long as the adult (length $215\ \mu$), due to the large size of the post-abdominal part. Epidermis distinctly striated. Legs stout and of very uniform size. The terminal part of the abdomen is strongly constricted and is narrower (breadth about $50\ \mu$) than the main body, and there are two stout outwardly curved hairs at the apex.

The eggs of this species are large (length $125\ \mu$ – $135\ \mu$, breadth $65\ \mu$), they are of a regular long oval form and the surface is marked with numerous light-refracting punctures.

Locality. Found in numbers in partly decayed Narcissus bulbs in County Dublin, January. The place of origin of the bulbs is uncertain.

At least three other species of *Tarsonemus* have been found in Ireland. One of these, noticed injuring oats at Killyarden, Co. Donegal, in August last, is possibly referable to *T. spirifex*, Marchal, the female agreeing well with Korff's figure of this species which is reproduced by Sorauer (Handbuch der Pflanzen-Krankheiten, iii. p. 102). The male of *T. spirifex* has the fourth pair of legs peculiarly modified, and until this sex is found this identification must remain somewhat doubtful.

The form of this female is a regular long oval (length $235\ \mu$, breadth $110\ \mu$). The capitulum is rather broad (breadth $35\ \mu$), but less so than in *T. laticeps*. The sensory organs are very distinctly leaf-shaped with sharply pointed extremities. The first two pairs of legs are short and stout.

This species was communicated by Dr. G. H. Pethybridge, who tells me it attacks oats in much the same way as *T. culmicolus*, Reuter, attacks meadow grasses in Finland. Reuter says the mites are found on the haulm, presumably within the leaf-sheath within the first node; they suck out the juices so that the inflorescence wilts and dies.

Females of *T. floricolus* were found on gooseberry plants at Lisburn, Co. Antrim, in July.

Colonel Samman tells me he finds *Acarapis woodi*, Hirst, commonly in the tracheæ of Irish honey-bees.

BIMICHAELIA CRASSIPALPIS, sp. nov. (Pl. 21. figs. 22 a, b.)

Allied to *B. setigera*, Berlese (4, p. 13), but larger, the palps are stouter, the shoulders less prominent, and the structure of the skin, which is elaborately sculptured, is different.

Colour white. Form sub-pentagonal (Pl. 21. fig. 22 a), shoulders prominent but less so than in *B. setigera*. Epidermis striated and marked with a distinct hexagonal pattern, the hexagons forming rosette groups round the body hairs, the latter are sparse and are branched at the base (fig. 22 b). Cephalothorax not well marked off from the abdomen; a narrow area enclosed by chitinous rods lies in the middle line, and two long sensory hairs are placed at its proximal extremity; behind these hairs are two semicircular stigmata. I can find no trace, however, of the small, clubbed, sensory organs which arise from these in other species of the genus (in a second specimen from another locality they are also absent); it is likely, however, that such organs may be sometimes present in the species. Abdomen thrown into folds and constricted at the middle, apex somewhat truncate. Palps stout. Legs short and very robust, distinctly areolated, hairs similar to those of the body. Length 320 μ , breadth 240 μ .

Localities. Found in sphagnum moss collected by Mr. A. W. Stelfox on the Garron Plateau, Co. Antrim, in July. It has also occurred in damp moss from Glencullen, Co. Dublin, in April of the present year.

ALICUS ROSTRATUS, Träg.

An *Alicus* found in two highland localities in Ireland agrees excellently with the present species, which is recorded from the Sarekgebirge (Swedish Lapland), except that the rostrum seems shorter than is described and figured (46). Drawings were sent to Dr. Trägårdh, and he believes there is a difference in this respect. However, they agree in so many characters that it does not seem desirable to describe the Irish specimens under a new name.

The colour during life is a reddish purple. Length 460 μ , breadth 270 μ . Cephalothorax with a distinct rostrum, and well marked off from the abdomen, central area defined by two subcutaneous chitinous ridges, the hinder part of which is areolated at the middle, and encloses the usual two pairs of long sensory hairs. Eyes small but distinct, placed on the front of lateral swellings. Abdomen with moderately marked shoulders and a sparse covering of short, spiculate hairs; during life the dorsum lies in distinct folds. Legs longer and more slender than is usual in this genus.

Localities. Found in moss collected on the Comeragh Mountains, Co. Waterford, in July; and in sphagnum from Glendhu, Co. Dublin, in October.

SCIRUS INERMIS, Träg. (Pl. 21. figs. 23 a, b.)

This species was described from specimens found on the surface of a small reservoir (Wassersammlung) at Gizeh, Cairo, in December 1900 (45). There can scarcely be any doubt that the specimens here recorded are the

same species. The palpi, which are characteristic in the species of this genus, are identical with those of *S. inermis*, Träg. Dr. Trägårdh, to whom drawings were sent, agrees with me in this identification. The following is a brief description of the Irish form:—Colour red (length $490\ \mu$). Body of the usual subrhomboidal form, shoulders prominent, the body margins gradually narrowing to the posterior margin where there are three small lobes. Epidermis minutely lined. Maxillary plate longer than broad; mandible long (length about $286\ \mu$), extremities reaching to near the end of the second palp segment. Palps (Pl. 21. fig. 23 *b*) long and slender, apparently four-segmented, second and third segments armed at their ventral extremity with a strong spatulate hair. Legs long and of very uniform thickness so that the tarsi are truncated at the ends, where they are armed with two flat lobes and small claws. Length of the first pair $510\ \mu$, of the fourth $530\ \mu$.

Locality. Found amongst dripping wet moss and liverworts (*Conocephalus conicus*) at the overflow of a small reservoir at Greystones, Co. Wicklow, July 1920, with such species as *Notaspis lacustris*, *Oribata lucasii*, *Episeius italicus*, and others.

NEOPHYLLOBIUS SAXATILIS, sp. nov. Pl. 21. figs. 24 *a, b*.)

Colour as in *N. elegans*, Berl. Form oval, cephalothorax not well marked off from abdomen. Eyes double lensed. There is a double row of six strong hairs, placed rather close together, down the middle of the body, and a row of eight similar hairs along each outer margin; all of these hairs are spiculate, rather strongly curved and arise from small tubercles. Epimera large, inner margins indistinct, with from two to three hairs which are much weaker than those of the dorsum. Genital area tapering to a point and enclosing a small anal plate with four marginal hairs. Rostrum triangular, ending in a single lobe. Palps very short and stout, second segment longer than the two end segments together, with two dorsal spines, one spiculate and stronger than the other; third segment with one dorsal spine; fourth segment ending in two curved spines, and carrying an appendage which is contracted at the apex and has three spines.

Legs much as in *N. elegans*, Berlese; there is a long spiculate hair on the third segment of each leg, that of the last pair bent at the end, length about $264\ \mu$ (fig. 24 *b*). The legs measure about $396\ \mu$, $330\ \mu$, $363\ \mu$, and $420\ \mu$ in length.

A species allied to *N. elegans*, Berlese (1, Fasc. xxxiv. n. 5), but differing in the size and form of the body. The median dorsal series of spines are more numerous and are placed closer together, and the long hairs on the third segment of the last pair of legs are shorter and of different form. Verified by Dr. Berlese.

Locality. Not uncommon on lichen-covered rocks at Howth summit, Co. Dublin, September.

BRYOBIA HUMERALIS, sp. nov. (Pl. 21. figs. 25 a-c.)

A small species, length about 330 μ , breadth 270 μ . Colour red. Body strongly and suddenly narrowed at both extremities, shoulders very prominent. Frontal tubercles of cephalothorax comparatively short, carrying strongly-curved spatulate hairs (Pl. 21. fig. 25 b). End margin of abdomen with five pairs of similar hairs, the three inner pairs being very conspicuous; there is also a double row of three or four hairs near the middle line of the body and a pair at the shoulders. Palps very short, appendage of fourth segment large and stout, terminal claw strongly curved. Legs shorter and stouter than in *B. pratiosa* and of more uniform breadth, the second segment of the first pair being noticeably shorter; the two end segments are of nearly equal length (Pl. 21. fig. 25 c).

Apart from the difference in the legs, this species may be known from *B. pratiosa* by the smaller size, the shorter frontal tubercles, the more strongly narrowed body, the more prominent shoulders, and the longer body hairs.

Localities. Found at Clontarf, near Dublin, in March 1907. The correspondent who sent me the specimens had his attention drawn to them by the patches of red colour on a garden wall caused by the presence of large numbers of this mite. North shore of Lough Neagh, in wet moss, August 1922. Mr. Evans has found the species amongst moss collected near Edinburgh.

RHAPHIGNATHUS PATRIUS, *Berl.*, var. *TRUNCATUS*, nov. (Pl. 22. figs. 26 a-c.)

A robust form evidently allied to *R. patrius*, *Berl.*, and in all probability a variety of this species. Differs notably in the narrower body; of the type *Dr. Berlese* remarks: "fere æque longium ac latum humeratum"; the end margin is very distinctly truncated, and the areolations of the epidermis are fewer and larger.

Length 420 μ , breadth 320 μ . Colour blood-red, with a central dark area in front and four dark blotches on each side of the body, much as in *Berlese's* drawing of *B. clavatus* (1, *Fasc. xxii. n. 2*). Cephalothorax bluntly pointed in front, the sides slightly sinuate behind this, and they merge evenly with the shoulders of the abdomen; the margins of the latter narrow gradually to the truncated end margin, at each angle of which there is a hair somewhat longer than the body hairs. There are nine pairs of hairs in all, including the frontal hairs, and the latter are the only ones which have a trace of secondary hairs. Epidermis very coarsely punctured, and there are paired circular pits close to the shoulders; the end of the dorsum is slightly depressed. On the ventral side the anal plate and the areas surrounding the epimera are strongly areolated, and on the hinder margins of the former are two spine-like hairs. Palps (Pl. 22. fig. 26 b) very stout; second segment with a long, bent hair, which may, apparently, be either simple or trifid at the extremity; third segment with a similar dorsal hair; length of palp about

95 μ . Legs very stout (length of first pair 264 μ , of fourth pair 254 μ), with strong dorsal hairs, which are spiculate at the base (Pl. 22. fig. 26 c).

Locality. A single specimen found amongst wet moss from the banks of a mountain-stream at Glencullen, Co. Dublin. Collected by A. W. Stelfox in October 1921.

I have also found amongst moss in a mountain-stream at Kilmashogue, Co. Dublin, a *Rhaphignathus* the identity of which is uncertain. It is very closely allied to a form described by Trügårdh as *R. patrius* var. *brevipalpis* (46, p. 470). The Irish specimen differs in the smaller size (length 368 μ , breadth 275 μ); it is less rotund, the puncture less regular, and the palps are relatively larger.

RHAPHIGNATHUS PLUMIFER, sp. nov. (Pl. 22. figs. 27 a, b.)

A very distinct species, which may be easily known from its congeners by the small size, the strongly plumose hairs, and the beautiful sculpturing of the epidermis. Verified by Dr. Berlese.

Male. Length 210 μ , breadth 120 μ . Colour bright red. In shape resembling *R. siculus*, being ovate, though the end of the body is produced in a point. All of the body hairs are strongly plumose. The epidermis is marked with a very distinct polygonal pattern as well as being punctured (fig. 27 b). Cephalothorax large in relation to the abdomen, carrying three pairs of hairs and a strongly-curved pair of frontal hairs. Eyes small yet distinct, and placed on the side margins. The main abdomen is much higher than the apical part, and is truncated at the end, where there are two rather long (40 μ) hairs, curved inwards at the extremities. In addition to these there are six pairs of hairs on the dorsum. Epimera well defined; anal plate large, rounded on the front margin. Maxillary plate transverse; rostrum sharply pointed. The palps are very stout, second segment with two strongly-plumose hairs. Legs short and robust, armed with both simple and plumose hairs like those of the body.

Locality. A single specimen found under a stone amongst heather on Howth Head, Co. Dublin, in September.

RHAPHIGNATHUS LONGIPILIS, sp. nov. (Pl. 22. fig. 38.)

Colour blood-red with blackish markings. Form short and broad. Front margin obtusely pointed, end margin rather truncated. Eyes small, placed near middle of side margins. Upper surface of cephalothorax and abdomen with a distinct, raised polygonal network. Abdomen well defined, shoulders rather prominent. Hair armature, including the frontal bristles, very long (about 125 μ), curved towards their extremities, and there is no trace of secondary hairs. Epimera small. Maxillary plate transverse. Palps very short and robust, distinctly stouter than the legs. The latter are of moderate length, and rather slender for this genus. Length 290 μ , breadth 380 μ .

Localities. Found amongst damp moss at Glencullen in April, and in moss collected from pools in the River Dodder, at Old Bawn, in May, by Mr. A. W. Stelfox. Both localities are in Co. Dublin.

STIGMÆUS ANTHRODES, *Berl.*, var. RETICULATUS, nov. (Pl. 22. figs. 28 a, b.)

A large, robust species. The Irish specimens are to be referred to a variety in which all of the body plates are sculptured with a very distinct, polygonal reticulation. Colour bright red. Cephalothorax protected by a large central shield and two small plates at the posterior corners. On the dorsum of the abdomen are ten shields, comprising three on the anterior part, then four smaller ones in a transverse row; behind these are two similar plates, and a large unpaired shield lies at the end of the abdomen. The palps, legs, epimera, and ventral plates are all marked with a polygonal network. Length 550 μ , breadth 310 μ .

Localities. Amongst hay brought into a cave at Doneraile, Co. Cork, in July. Under refuse on the sea-bank at Malahide, in May. Amongst garden refuse at Rathgar, Dublin, in April. Mr. A. W. Stelfox found it abundantly in the last-mentioned locality.

CALIGONUS SCAPULARIS (*Koch*), *Berlese*.

A shining red species of very convex form. The eyes are very large and the body hairs are long and curved.

Localities. In sphagnum, Lough Dan, in August, and in moss from pools by the River Dodder, near Tallaght, in May.

CHEYLETUS VENUSTISSIMUS, *Koch*.

Locality. Found in numbers on a Hay Moth (*Caradrina*) at Sandymount in November by Mr. J. G. Rhynehart. *Cheyletus eruditus*, *Schr.*, has been found on pine-shoots in August.

HYDRACARINA.

Drammenia crassipalpis, Sig Thor. The genus *Drammenia* was established by Thor in 1913 (44) with *D. elongata* as the type-species. In the same paper Thor partially described a second species, *D. crassipalpis*, but apparently the single specimen, found at Drammen in Norway, was lost before a description had been made; such characters as are mentioned chiefly refer to points in which this species differs from *D. elongata*. As far as one can judge from these notes, the form briefly described below is in all probability the same as *D. crassipalpis*, Thor. Colour yellow with brown cœcal markings. Length 474 μ , breadth 374 μ . Cuticle strongly chitinized, except for a marginal band separating the dorsal and ventral plates. Front margin truncated, sides gradually increasing in width to beyond the middle of the body, posterior margin slightly flattened. Dorsal plate punctured, touching

the front margin of the body, separated from edge of ventral plate at the side and end margins by a rather broad band of soft, striated cuticle, which contains about five pairs of pores. On the dorsal plate is a double row of similar pores, near each of which is a fine hair. Eyes placed at each corner of the front margin on the dorsal outline of the body. Frontal bristles very short (Pl. 22. fig. 29 a). Epimeral region much as in *D. elongata*, except the outer border of the fourth pair, instead of being absent, is indistinctly defined (Pl. 22. fig. 29 b). The genital plate is shorter (length 132 μ , breadth 100 μ). Length of maxillary plate to tip of rostrum 120 μ . Palps very stout, the second segment broader than the legs (breadth in dorsal view 49 μ); on its inner ventral margin is a low, rounded prominence and a strong hair as in the type-species. Inner distal angle of the fourth segment produced in the form of a strong triangular tooth, and beside this is a smaller tooth, both bearing fine hairs; near the dorsal line of the palps are a few short spines (Pl. 22. fig. 29 c). Legs of moderate length, stout, armed with short spines and without swimming-hairs; the lengths are about 240 μ , 374 μ , 330 μ , and 410 μ .

Locality. A single specimen found amongst sphagnum moss collected on Ott Mountain, in the Mourne Mountains, in May by Mrs. R. F. Scharff.

Ljania bipapillata, Sig Thor, has been found in the River Dodder, near Dublin, in November; in the River Dorgle, at Powerscourt, and in the stream flowing between the lakes at Glendalough, Co. Wicklow, in April. The colour of living specimens is pale yellow with brownish markings. *Megapus gibberipalpis*, Piersig (40), occurs in streams on the Dublin Mountains at Kilkee and Kilmashogue, and in the River Liffey. Also in the stream flowing from Lough Eighter, on Carrantuohill Mountain, in Co. Kerry. *Arrhenurus insulanus*, Koenike: a single immature specimen of this species occurred in a small Chara pool at Gollierstown, Co. Dublin, in October. The male has not been described. The female is red in colour, and is remarkable on account of the large wing-shaped genital plates and the long and narrow epimera especially of the third and fourth pairs. The species is well figured by Dr. Koenike (26); the type was found on Norderney. I believe this species has also been found by Mr. C. D. Soar in England.

Apart from a few records of the common *Hydryphantes ruber*, de Geer, nothing has been published on the species of *Hydryphantes* occurring in Ireland. I have recently been making a preliminary examination of specimens of this interesting genus from various Irish localities, and find there are at least six species found in this country, counting *H. prolongatus*, Thon, of specific rank. A certain amount of variation occurs in the form of the eye-plates of *Hydryphantes*; and as the structure of the plates is of great use in the identification of the species, a series of figures are given in the present paper, in the hope that they may be of interest for comparison with those of the same species in other countries.

The type-species of the genus, *H. ruber*, de Geer, is common and widespread in Ireland (Pl. 22. fig. 30), as is also *H. prolongatus*, Thon (Pl. 22. fig. 31), which is sometimes recorded as a variety of the former; in my experience it is rather the exception to find both of these occurring in the one locality. The first-mentioned has been found in ponds and lakes in Donegal, Antrim (L. Neagh), Monaghan, Galway, Wexford and Dublin, and the latter in Donegal, Dublin, Kildare, Galway and Kerry. *H. prolongatus* is perhaps of more frequent occurrence. The eye-plate and palps of a curious form, which must, I think, be regarded as an aberration of *H. prolongatus*, are figured (Pl. 22. figs. 32 *a*, *b*). The general structure is as in the species, but the eye-plate is smaller and narrower especially across the front margin (length along middle line $363\ \mu$, breadth $373\ \mu$), and the median eye is placed much nearer the middle of the plate. Unfortunately, only one specimen was found in a small lake on Lough Salt Mountain, in Donegal. *H. bayeri*, Pisarovic (Pl. 22. fig. 33), is apparently rare; I have found a single specimen in a drain by the River Shannon, at Portumna, in June. *H. bayeri nonundulata*, Viets (Pl. 22. fig. 34) was found in a pool at the entrance to Glenshelane Valley, at Cappoquin, Co. Waterford, in June. It has also occurred under stones on the marshy edge of Bount Brown Lough, near Westport, in Co. Mayo. The water-level of the lough had fallen considerably at the time (July 1911). In the structure of the eye-plate this form bears a strong resemblance to *H. planus*, Thon, but the plate is more abruptly narrowed behind the anterior corners, the breadth across the hinder part is relatively greater, and the posterior emargination is less deep than in *H. planus*. The median eye is placed far back as in the type. Viets records this form from Eastern Prussia (47). *H. crassipalpis*, Koenike, was found in ponds near Enniscorthy, Co. Wexford, in May. This species may be easily recognized by the form of the eye-plate and the short, thick palps; described by Dr. Koenike from Borkum and the neighbourhood of Bremen, where it is rare (27). At Killarney I have found a *Hydryphantes* which seems referable to a form of this species. The eye-plate (Pl. 22. fig. 35 *a*) is smaller (length along middle line $298\ \mu$, breadth $418\ \mu$) and the anterior corners are most acute; the sides are more deeply indented, and the posterior emargination is deeper. The palps (fig. 35 *b*) are shorter (length about $300\ \mu$) than in the typical form; the second segment (length $110\ \mu$) has four short dorsal spines on the upper surface and three longer, feathered hairs placed at the upper corner of the inner surface of the segment. This form, which may be called *lacustris*, forma nov., was found in Loosecaunagh Lough, between Killarney and Kenmare, in the month of April. *H. placationis*, Thon (Pl. 22. fig. 36), not common; found in ponds near Galway in June, and in ponds in the Phoenix Park, Dublin, in April. *H. dispar* (Schaub) is apparently rare in Ireland; found in company with the preceding species in ponds in the Phoenix Park in April. The eye-plate is figured (Pl. 22. fig. 37).

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EXPLANATION OF THE PLATES.

PLATE 20.

- Fig. 1. *Gamasus (Eugamasus) crassitarsis*, sp. nov. Male. *a.* Chelicerae. *b.* Second leg. *c.* Process on outer side of femur of second leg, dorso-ventral view.
 2. *Gamasellus (Protolaelaps) granulatus*, sp. nov. Female. *a.* Under side. *b.* Part of dorsal plate and soft epidermis.
 3. *Gamasellus (Protolaelaps) subnudus?*, Berl. Larva.
 4. *Laelaps latisternus*, sp. nov. Female. Under side.
 5. *Laelaps simplex*, sp. nov. Female. Under side.
 6. *Laelaps fimbriatus*, sp. nov. Female. Genital and ventro-anal plates.
 7. *Lasioseius (Lasios.) gracilis*, sp. nov. Female. *a.* Upper side. *b.* Hair of posterior margin. *c.* Ambulacrum.
 8. *Lasioseius (Lasios.) ometes*, Oudem. Female. *a.* Under side. *b.* Shoulder bristle. *c.* Chelicerae.
 9. *Lasioseius (Episeius) glaber*, Berl., var. *curtipes*, nov. Female. Under side.
 10. *Lasioseius (Episeius) sphagui*, sp. nov. Female.

- Fig. 11. *Lasioseius (Episeius) italicus*, Berl. Male chelicerae.
 12. *Lasioseius (Episeius) michaeli*, sp. nov. Male chelicerae.
 13. *Lasioseius (Episeius) major*, sp. nov. Female: *a.* Under side. Male: *b.* Chelicerae.
 14. *Lasioseius (Platyseius) subglaber* (Oudem.). Male chelicerae.
 (The male chelicerae figured in 11, 12, and 14 are drawn to the same magnification.)

PLATE 21.

- Fig. 15. *Zercon tragardhi*, sp. nov. *a.* Upper side. *b.* Plumose hair.
 16. *Ceratozercon bicornis* (Can. et Fanzago). One of the terminal tubercles.
 17. *Polyaspinus cylindricus*, Berl. Upper side.
 18. *Trachyurogoda trogluoides*, Can. et Fanzago, var. *celtica*, Halbt. Upper side.
 19. *Dameosoma minus*, Paoli, var. *lanellata*, nov. *a.* Upper side. *b.* Pseudostigmatic organ.
 20. *Dameosoma maculosa*, Warburton and Pearce. Cephalothorax.
 21. *Tarsonemus laticeps*, sp. nov. Female: *a.* Anterior part of cephalothorax. Male: *b.* Under side; *c.* Fourth leg.
 22. *Bimichaslia crassipalpis*, sp. nov. *a.* Upper side. *b.* Hexagonal marking of epidermis.
 23. *Scirus inermis*, Trägårdh. *a.* Upper side. *b.* Palp.
 24. *Neophyllobius saxatilis*, sp. nov. *a.* Upper side. *b.* End segments of the fourth leg.
 25. *Bryobia humeralis*, sp. nov. *a.* Upper side. *b.* Body hair. *c.* First leg.

PLATE 22.

- Fig. 26. *Rhaphignathus patrius*, Berl., var. *truncatus*, nov. *a.* Upper side. *b.* Right palp. *c.* Segment of leg.
 27. *Rhaphignathus plumifer*, sp. nov. *a.* Upper side. *b.* Epidermis.
 28. *Stigmaeus anthrodes* var. *reticulatus*, nov. *a.* Upper side. *b.* One of the dorsal shields.
 29. *Drammenia crassipalpis*, Sig Thor. *a.* Upper side. *b.* Epimeral region. *c.* Palp.
 30. *Hydryphantes ruber*, de Geer. Eye-plate (River Baun).
 31. *Hydryphantes prolongatus*, Thon. Eye-plate (Galway).
 32. *Hydryphantes prolongatus*, Thon (Ab.). *a.* Eye-plate. *b.* Palp (Donegal).
 33. *Hydryphantes bayeri*, Thon. Eye-plate (River Shannon).
 34. *Hydryphantes bayeri* var. *nomundulata*, Viets. Eye-plate.
 35. *Hydryphantes crassipalpis*, Koen., forma *lacustris*, nov. *a.* Eye-plate. *b.* Palp.
 36. *Hydryphantes placationis*, Thon. Eye-plate.
 37. *Hydryphantes dispar*, von Schaub. Eye-plate.
 38. *Rhaphignathus longipilis*, sp. nov. Palp.

(All eye-plates of *Hydryphantes* are drawn to the same magnification, with the exception of number 35.)

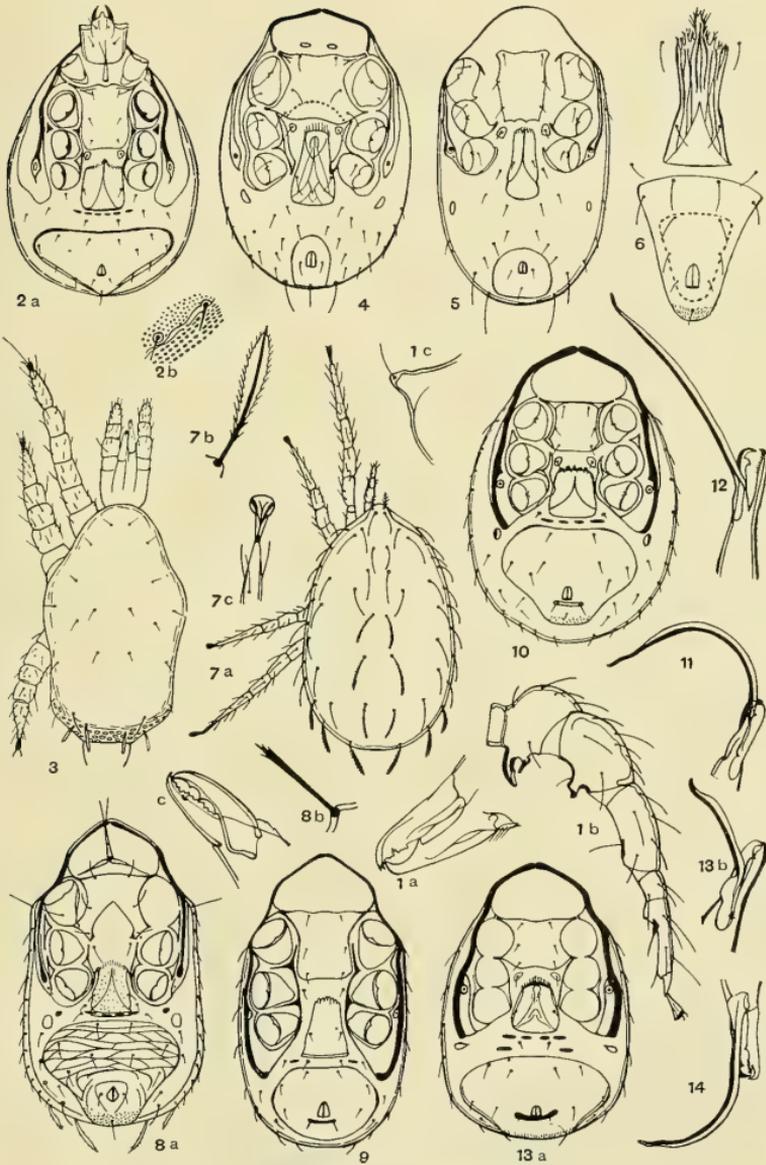
Note I.—LASIOSEIUS (LASIOS.) OMETES, Oudem.

In a paper just received, Vitzthum describes and figures this species from Austrian specimens found in the borings of "bark-beetles." (Arch. f. Naturg. 89 Jahrg. 1923.)

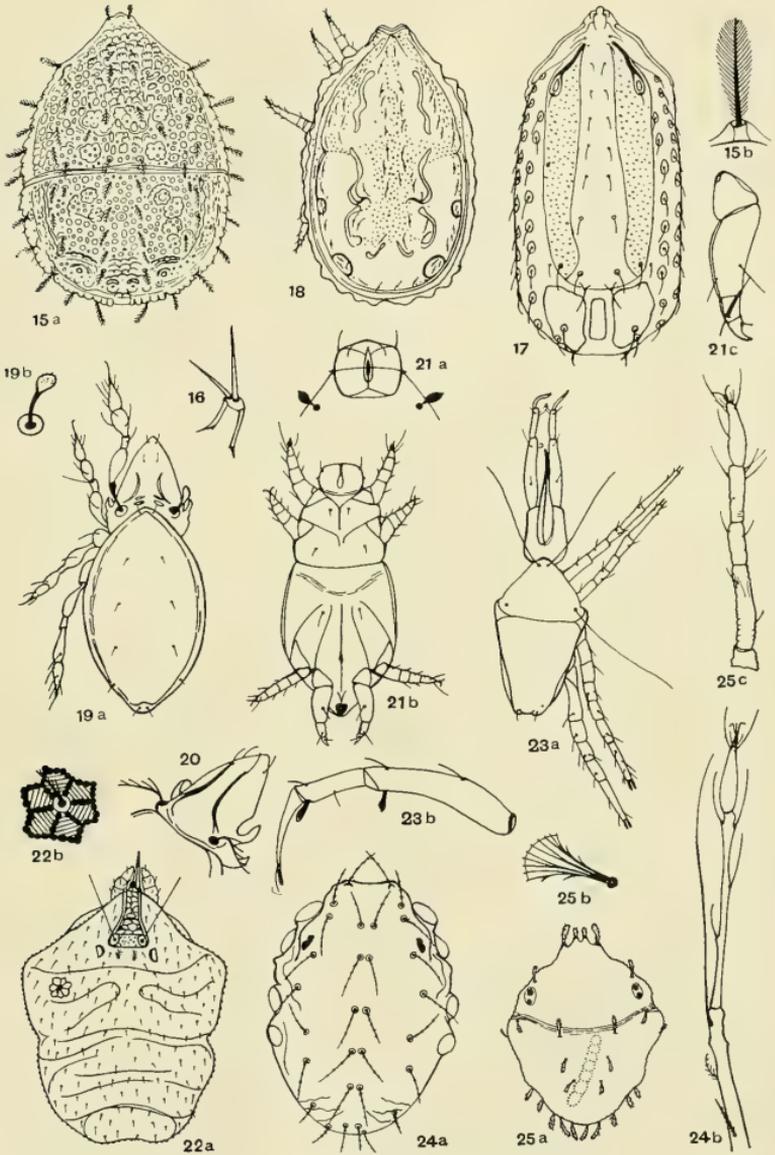
Note II.—*Drammenia crassipalpis*, Sig Thor. Additional localities for this species are—Stream above Lough Nahanagan at 1500 feet, in submerged moss in June. Glencree, amongst wet moss and sphagnum at 500 feet in September; both of these localities are in the County Wicklow. Also amongst sphagnum on Featherbed Mountain in County Dublin at an elevation of 1600 feet, in September 1922.

4th July, 1923.

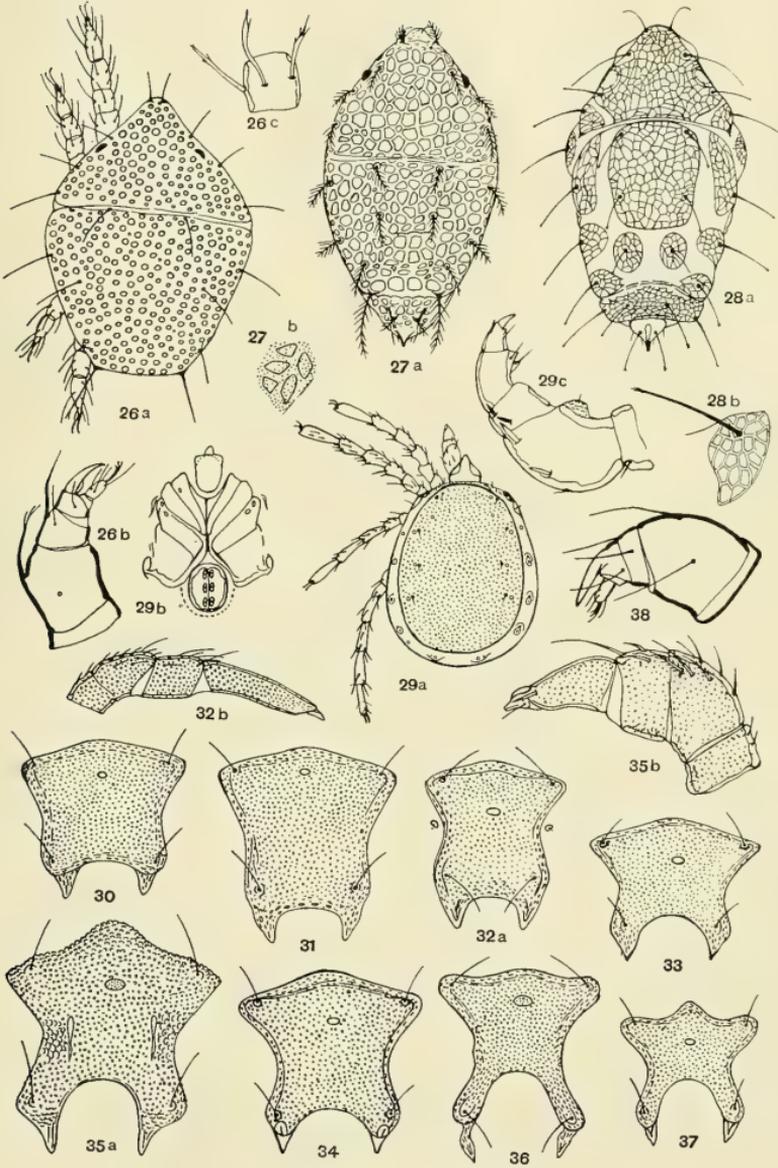
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